

WHAT IS CLAIMED IS:

1. A jet propulsion system for a watercraft comprising:
 - an impeller;
 - a pump housing enclosing the impeller;
 - a venturi coupled to the pump housing and having a flexible portion that has a discharge opening with a cross-sectional shape and an area;
 - at least one movable member associated with the flexible portion; and
 - an actuator coupled to the at least one movable member that selectively moves the at least one movable member to flex the flexible portion and alter the cross-sectional shape and the area of the discharge opening.
2. The jet propulsion system of claim 1, wherein the discharge opening has a perimeter with a fixed length.
3. The jet propulsion system of claim 1, wherein the actuator causes the at least one movable member to selectively flex the flexible portion between first and second positions, and wherein the area of the discharge opening is larger in the first position than in the second position.
4. The jet propulsion system of claim 3, wherein the cross-sectional shape of the discharge opening is substantially circular in the first position and substantially oval in the second position.
5. The jet propulsion system of claim 3, wherein the at least one movable member comprises first and second members connected to opposite sides, respectively, of the flexible portion, and
 - wherein the first and second members move toward each other to move the flexible portion from the first position to the second position.
6. The jet propulsion system of claim 1 in combination with a watercraft comprising:
 - a hull supporting the jet propulsion system; and

an engine supported by the hull and operatively connected to the jet propulsion system.

7. The combination of claim 6, wherein the jet propulsion system further comprises a venturi controller operatively connected to the actuator, and wherein the venturi controller selectively controls the actuator to automatically move the at least one movable member in response to at least one watercraft parameter.

8. A jet propulsion system for a watercraft comprising:
an impeller;
a pump housing enclosing the impeller;
a venturi coupled to the pump housing and having a rearward discharge opening and at least one additional discharge passage permitting fluid communication between an inside of the venturi and an ambient environment;
a valve disposed in the at least one additional discharge passage; and
an actuator connected to the at least one valve to selectively regulate fluid flow through the at least one additional discharge passage.

9. The jet propulsion system of claim 8, wherein the at least one additional discharge passage comprises a hole in a peripheral portion of the venturi, the hole being disposed forwardly from the rearward discharge opening.

10. The jet propulsion system of claim 9, wherein the at least one additional discharge passage further comprises a tube connected to the hole and extending rearwardly from the hole, wherein the valve is operatively connected to the tube.

11. The jet propulsion system of claim 8, wherein the at least one additional discharge passage comprises a plurality of discharge passages that are circumferentially spaced from each other around a perimeter of the venturi.

12. The jet propulsion system of claim 8 in combination with a watercraft comprising:
a hull supporting the jet propulsion system; and

an engine supported by the hull and operatively connected to the jet propulsion system.

13. The combination of claim 12, wherein the jet propulsion system further comprises a venturi controller operatively connected to the actuator, and wherein the venturi controller selectively controls the actuator to automatically control the valve.

14. A jet propulsion system for a watercraft comprising:
an impeller;
a pump housing enclosing the impeller;
a venturi coupled to the pump housing and having a flexible, tubular portion that defines a discharge opening;
a collar mounted to the flexible, tubular portion; and
an actuator connected to the collar,
wherein the actuator selectively tightens the collar to squeeze the flexible, tubular portion radially inwardly and reduce a cross-sectional area of the discharge opening.

15. The jet propulsion system of claim 14, wherein the flexible, tubular portion comprises a plurality of rearwardly-extending, flexible, circumferentially-spaced venturi sections.

16. The jet propulsion system of claim 15, wherein circumferentially-adjacent venturi sections overlap each other such that a circumferential end of each section is disposed radially-inwardly from an adjacent circumferential end of an adjacent section.

17. The jet propulsion system of claim 14, further comprising a pump housing disposed around the impeller, and wherein a forward end of the flexible, tubular portion is rigidly mounted to a rearward end of the pump housing.

18. The jet propulsion system of claim 14, wherein the collar comprises an arc-shaped strip having first and second ends, and the actuator comprises a tightening mechanism connected between the first and second ends, wherein the tightening mechanism selectively

moves the first and second ends with respect to each other to change an inner diameter of the arc-shaped strip.

19. The jet propulsion system of claim 14 in combination with a watercraft comprising:
a hull supporting the jet propulsion system; and
an engine supported by the hull and operatively connected to the jet propulsion system.

20. The combination of claim 19, wherein the jet propulsion system further comprises a venturi controller operatively connected to the actuator, and wherein the venturi controller selectively controls the actuator to automatically tighten the collar.

21. A jet propulsion system for a watercraft comprising:
an impeller;
a pump housing enclosing the impeller;
a venturi coupled to the pump housing, the venturi comprising
a body portion having first and second planar interior surfaces spaced in a generally parallel relationship, and
an end flap coupled to the body portion and movable between first and second positions relative to the body portion, the end flap being disposed between the first and second interior surfaces, the end flap having side walls that substantially abut the first and second interior surfaces when the end flap is in the first and second positions, wherein the body portion and the end flap each have rearward edges that define a discharge opening; and
an actuator connected to the end flap,
wherein the actuator moves the end flap relative to the body portion between the first and second positions, a cross-sectional area of the discharge opening being larger when the end flap is in the first position than in the second position.

22. The watercraft of claim 21, wherein the end flap is substantially planar adjacent the rearward edge.

23. The watercraft of claim 21, wherein the end flap is pivotally connected to the body portion at a pivotal axis that is perpendicular to the interior surfaces.
24. The watercraft of claim 21, wherein the discharge opening has a continuous perimeter regardless of whether the end flap is in the first or second position.
25. The jet propulsion system of claim 21 in combination with a watercraft comprising:
a hull supporting the jet propulsion system; and
an engine supported by the hull and operatively connected to the jet propulsion system.
26. The combination of claim 25, wherein the jet propulsion system further comprises a venturi controller operatively connected to the actuator, and wherein the venturi controller selectively controls the actuator to automatically move the end flap.